WHAT IS CLAIMED IS:

1. An OFDM receiver apparatus to receive an OFDM signal, comprising:

a receiver to receive an OFDM signal having a plurality of sub-carriers every symbol;

a distortion estimator which estimates a distortion using each sub-carrier of the sub-carriers of the OFDM signal to generate channel distortion information;

a distortion compensator which subjects the sub-carrier to distortion compensation according to a control signal to generate a distortion-compensated sub-carrier;

a demodulator to demodulate the distortion-compensated sub-carrier;

a phase distortion estimator to generate first phase distortion information indicating a phase distortion of each sub-carrier every symbol, using the distortion-compensated sub-carrier and the distortion information;

a weighting synthesizer to weight the first phase distortion information by a plurality of weighting factors with time function over a plurality of symbol intervals and then synthesize the first phase distortion information, to generate a plurality of second phase distortion information; and

a control signal generator to generate the control

signal using the distortion information and the plurality of second phase distortion information.

2. An OFDM receiver apparatus according to claim 1, which further includes

a converter to convert the received OFDM signal to a digital baseband signal;

a synchronizer to synchronize the digital baseband signal with respect to a time and a frequency to generate a synchronized digital baseband signal; and

a separation unit configured to separate the sub-carriers of the OFDM signal by subjecting the synchronized digital baseband signal to a Fourier transform.

3. An OFDM receiver apparatus according to claim 1, wherein the symbol includes a data sub-carrier and a known sub-carrier as the sub-carrier signal, the phase distortion estimation unit has a phase distortion information threshold, and weights and synthesizes a phase error component of the known sub-carrier of the distortion-compensated sub-carrier signal, and generate the first phase distortion information by clipping a weighted and synthesized component using the phase distortion information threshold.

4. The OFDM receiver apparatus according to claim 1, wherein the symbol includes a data sub-carrier and a known sub-carrier as the sub-carrier signal, and the weighting synthesizer and the weighting moving

average unit each use as the weighting factor a first weighting coefficient and a second weighting coefficient which differ in coefficient value between an interval corresponding to the data sub-carrier and an interval corresponding to the known sub-carrier.

5. The OFDM receiver apparatus according to claim 1, wherein the symbol includes signal of data sub-carrier and a known sub-carrier as the sub-carrier signal, and one of the weighting synthesizer and the weighting moving average unit uses a first weighting factor whose value is substantially constant in time in an interval corresponding to the data sub-carrier, and a second weighting factor whose past coefficient value is small relatively in an interval corresponding to the known sub-carrier.

6. The OFDM receiver apparatus according to claim 1, wherein the symbol includes a data sub-carrier and a known sub-carrier as the sub-carrier signal, one of the weighting synthesizer and the weighting moving average unit generates the second phase distortion information using as the weighting factor a first weighting coefficient and a second weighting coefficient which differ in coefficient value between an interval corresponding to the data sub-carrier and an interval corresponding to the known sub-carrier, and the control signal generator generates the control signal by means of the second phase distortion

information generated by the weighting synthesizer using the first weighting factor in the interval corresponding to the data sub-carrier, and generates the control signal by means of the second phase distortion information generated by the weighting synthesizer using the second weighting factor in the interval corresponding to the known sub-carrier.

7. The OFDM receiver apparatus according to claim 1, which further comprises a residual distortion removing unit configured to remove a residual distortion from the distortion-compensated sub-carrier.

8. An OFDM receiver apparatus to receive an OFDM signal, comprising:

a receiver to receive an OFDM signal having a plurality of sub-carriers;

a distortion estimator which estimates a distortion by using each sub-carrier of the received OFDM signal, to generate distortion information indicating the distortion;

a distortion compensator which subjects the sub-carrier to distortion-compensation according to a control signal to generate a distortion-compensated sub-carrier;

a demodulator to demodulate the distortion-compensated sub-carrier;

a phase distortion estimator which generates first phase distortion information indicating a phase

distortion of the distortion-compensated sub-carrier every symbol, using the distortion-compensated sub-carrier and the distortion information;

a weighting moving average unit configured to subject the phase distortion information to weighted moving average by using a weighting factor with time function over a plurality of symbol intervals, to generate second phase distortion information; and

a control signal generator to generate the control signal by means of the distortion information and the second phase distortion information.

9. An OFDM receiver apparatus according to claim 8, which further includes

a converter to convert the received OFDM signal to a digital baseband signal;

a synchronizer to synchronize the digital baseband signal with respect to a time and a frequency to generate a synchronized digital baseband signal; and

a separation unit configured to separate the sub-carriers of the OFDM signal by subjecting the synchronized digital baseband signal to a Fourier transform.

10. An OFDM receiver apparatus according to claim 8, wherein the symbol includes a data sub-carrier and a known sub-carrier as the sub-carrier signal, the phase distortion estimation unit has a phase distortion information threshold, and weights and synthesizes

a phase error component of the known sub-carrier of the distortion-compensated sub-carrier signal, and generate the first phase distortion information by clipping a weighted and synthesized component using the phase distortion information threshold.

11. A OFDM receiver apparatus according to claim 8, wherein one of the weighting synthesizer and the weighting moving average unit includes a selector to select the weighting factor from a plurality of weighting factor candidates of a plurality of time functions.

12. The OFDM receiver apparatus according to claim 8, wherein the symbol includes a data sub-carrier and a known sub-carrier as the sub-carrier signal, and the weighting synthesizer and the weighting moving average unit each use as the weighting factor a first weighting coefficient and a second weighting coefficient which differ in coefficient value between an interval corresponding to the data sub-carrier and an interval corresponding to the known sub-carrier.

13. The OFDM receiver apparatus according to claim 8, wherein the symbol includes signal of data sub-carrier and a known sub-carrier as the sub-carrier signal, and one of the weighting synthesizer and the weighting moving average unit uses a first weighting factor whose value is substantially constant in time in an interval corresponding to the data sub-carrier, and

a second weighting factor whose past coefficient value is small relatively in an interval corresponding to the known sub-carrier.

14. The OFDM receiver apparatus according to claim 8, wherein the symbol includes a data sub-carrier and a known sub-carrier as the sub-carrier signal, one of the weighting synthesizer and the weighting moving average unit generates the second phase distortion information using as the weighting factor a first weighting coefficient and a second weighting coefficient which differ in coefficient value between an interval corresponding to the data sub-carrier and an interval corresponding to the known sub-carrier, and the control signal generator generates the control signal by means of the second phase distortion information generated by the weighting synthesizer using the first weighting factor in the interval corresponding to the data sub-carrier, and generates the control signal by means of the second phase distortion information generated by the weighting synthesizer using the second weighting factor in the interval corresponding to the known sub-carrier.

15. The OFDM receiver apparatus according to claim 8, which further comprises a residual distortion removing unit configured to remove a residual distortion from the distortion-compensated sub-carrier.

16. An OFDM receiver apparatus to receive an OFDM

signal, comprising:

a receiver to receive an OFDM signal including a plurality of sub-carriers every symbol;

a channel distortion estimator which estimates a distortion using each sub-carrier of the sub-carriers of the OFDM signal to generate distortion information indicating the distortion;

a distortion compensator which subjects the sub-carrier to distortion compensation according to a control signal to generate a distortion-compensated sub-carrier;

a demodulator to demodulate the distortion-compensated sub-carrier;

a phase distortion estimator to generate first phase distortion information indicating a phase distortion of each sub-carrier every symbol, using the distortion-compensated sub-carrier and the distortion information;

a weighting synthesizer to weight the first phase distortion information by a plurality of weighting factors with time function over a plurality of symbol intervals and then synthesize the first phase distortion information, to generate a plurality of second phase distortion information corresponding to the weighting factors; and

a control signal generator to generate the control signal using the channel distortion information and

the plurality of second phase distortion information substantially to weight the sub-carriers by the weighting factors, individually.

17. An OFDM receiver comprising:

a receiver circuit configured to receive an OFDM signal including a plurality of sub-carriers every symbol;

a distortion evaluation circuit configured to evaluate a distortion using each of the sub-carriers of the OFDM signal, and generate channel distortion information;

a distortion compensation circuit to subject the sub-carriers to distortion compensation according to a control signal and to generate a plurality of distortion-compensated sub-carriers;

a demodulation circuit configured to demodulate the distortion-compensated sub-carriers;

a phase distortion estimation circuit configured to generate first phase distortion information indicating a phase distortion of each sub-carrier every symbol, using the distortion-compensated sub-carrier and the channel distortion information;

a weighting synthesis circuit configured to generate a plurality of second phase distortion information corresponding to a plurality of weighting factors by weighting the first phase distortion information using the weighting factors of a time

function over a plurality of symbol intervals; and

a control signal generation circuit configured to generate the control signal using the channel distortion information and the second phase distortion information in order to weight the sub-carriers by the weighting factors individually.

18. The OFDM receiver according to claim 17, wherein the distortion compensation circuit comprises a distortion compensation circuit to subject each sub-carrier signal to distortion-compensation plural times.

19. The OFDM receiver according to claim 18, wherein the distortion compensation circuit comprises a first equalizer to subject each sub-carrier signal from the receiver circuit to distortion compensation according to the first control signal and a second equalizer to subject an output signal of the first equalizer to distortion compensation according to the second control signal.